

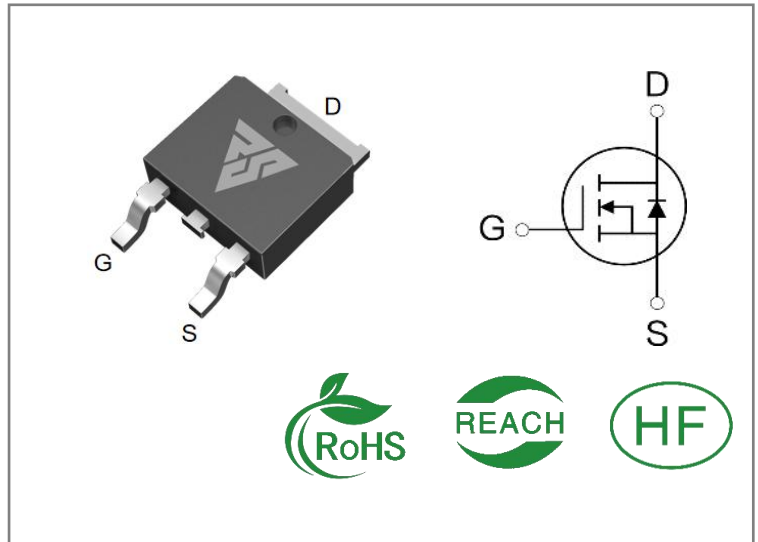
| ID   | $R_{DS(ON)}$ (Typ) | VDSS |
|------|--------------------|------|
| 7.3A | 530mΩ              | 700V |

**Applications:**

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC-DC Switching Power Supply

**Features:**

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability


**Ordering Information**

| Part Number | Package | Marking   | Packing   | Qty.     |
|-------------|---------|-----------|-----------|----------|
| RS70R600D   | T0-252  | RS70R600D | Tape&reel | 2500 PCS |

**Absolute Maximum Ratings**  $T_c = 25^\circ\text{C}$  unless otherwise specified

| Symbol      | Parameter   | RS70R600D  | Units            |
|-------------|---|------------|------------------|
| VDSS        | Drain-to-Source Voltage   | 700        | V                |
| ID          | Continuous Drain Current $T_C=25^\circ\text{C}$   | 7.3        | A                |
| ID          | Continuous Drain Current $T_C=100^\circ\text{C}$  | 4.5        |                  |
| IDM         | Pulsed Drain Current (Note*1)   | 24         |                  |
| PD          | Power Dissipation   | 60         | W                |
| VGS         | Gate- to- Source Voltage  | $\pm 30$   | V                |
| EAS         | Single Pulse Avalanche Energy<br>$L=10\text{mH}, V_{DS}=50\text{V}, R_G=25\Omega, T_C=25^\circ\text{C}$ | 129        | mJ               |
| dv/dt       | MOSFET dv/ dt ruggedness $V_{DS}=0\ldots 400\text{V}$   | 50         | V/ns             |
| dv/dt       | Reverse diode dv/dt $V_{DS}=0\ldots 400\text{V}, T_j=25^\circ\text{C}, I_{SD}\leq I_D$                  | 15         | V/ns             |
| TL TPKG     | Maximum Temperature for Soldering   | 300        | $^\circ\text{C}$ |
|             | Leads at 0.063in(1.6mm)from Case for 10 seconds<br>Package Body for 10 seconds                          | 260        |                  |
| TJ and TSTG | Operating Junction and Storage Temperature Range  | -55 to 150 |                  |

\* Drain Current Limited by Maximum Junction Temperature

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" Table may cause permanent damage to the device.

**Thermal Resistance**

| Symbol        | Parameter            | RS70R600D | Units  | Test Conditions   |
|---------------|----------------------|-----------|--------|---|
| R $\theta$ JC | Junction-to-Case     | 2.1       | °C / W | Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 °C |
| R $\theta$ JA | Junction-to- Ambient | 62.5      |        | 1 cubic foot chamber,free air.  |

**OFF Characteristics** TJ= 25°C unless otherwise specified

| Symbol | Parameter                           | Min. | Typ. | Max. | Units | Test Conditions    |
|--------|-------------------------------------|------|------|------|-------|--------------------|
| BVDSS  | Drain- to- source Breakdown Voltage | 700  | --   | --   | V     | VGS=0V<br>ID=250μA |
| IDSS   | Drain- to- Source Leakage Current   | --   | --   | 1    | μA    | VDS=700V<br>VGS=0V |
| IGSS   | Gate- to- Source Forward Leakage    | --   | --   | 100  | nA    | VGS=30V<br>VDS=0V  |
|        | Gate- to- Source Reverse Leakage    | --   | --   | -100 |       | VGS=-30V<br>VDS=0V |

**ON Characteristics** TJ=25°C unless otherwise specified

| Symbol  | Parameter                                      | Min. | Typ. | Max. | Units | Test Conditions     |
|---------|--|------|------|------|-------|---------------------|
| RDS(on) | Static Drain- to- Source On-Resistance(Note*2) | --   | 530  | 600  | mΩ    | VGS=10V<br>ID=2A    |
| VGS(TH) | Gate Threshold Voltage                         | 2    | --   | 4    | V     | VGS=VDS<br>ID=250μA |

**Resistive Switching Characteristics** Essentially independent of operating temperature

| Symbol  | Parameter            | Min. | Typ. | Max. | Units | Test Conditions               |
|---------|----------------------|------|------|------|-------|-------------------------------|
| td(ON)  | Turn- on Delay Time  | --   | 17   | --   | nS    | VDS=350V<br>ID=7.3A<br>RG=25Ω |
| trise   | Rise Time            | --   | 26   | --   |       |                               |
| td(OFF) | Turn- OFF Delay Time | --   | 53   | --   |       |                               |
| tfall   | Fall Time            | --   | 38   | --   |       |                               |

**Dynamic Characteristics** Essentially independent of operating temperature

| Symbol | Parameter                       | Min. | Typ. | Max. | Units | Test Conditions                |
|--------|---------------------------------|------|------|------|-------|--------------------------------|
| Ciss   | Input Capacitance               | --   | 473  | --   | pF    | VGS=0V<br>VDS=50V<br>f=400kHz  |
| Coss   | Output Capacitance              | --   | 36   | --   |       |                                |
| Crss   | Reverse Transfer Capacitance    | --   | 1.7  | --   |       |                                |
| Qg     | Total Gate Charge               | --   | 13   | --   | nC    | VDS=520V<br>ID=7.3A<br>VGS=10V |
| Qgs    | Gate- to- Source Charge         | --   | 2.1  | --   |       |                                |
| Qgd    | Gate-to-Drain(" Miller") Charge | --   | 6.9  | --   |       |                                |

**Source- Drain Diode Characteristics**

| Symbol | Parameter                 | Min. | Typ. | Max. | Units | Test Conditions                     |
|--------|---------------------------|------|------|------|-------|-------------------------------------|
| IS     | Continuous Source Current | --   | --   | 7.3  | A     | Integral pn- diode<br>in MOSFET     |
| ISM    | Maximum Pulsed Current    | --   | --   | 24   | A     |                                     |
| VSD    | Diode Forward Voltage     | --   | --   | 1.2  | V     | IS=7.3A,VGS=0V                      |
| trr    | Reverse Recovery Time     | --   | 220  | --   | nS    | VR=100V<br>IS=7.3A<br>di/dt=100A/μs |
| Qrr    | Reverse Recovery Charge   | --   | 2    | --   | μC    |                                     |

**Notes:**

- \* 1. Repetitive rating,pulse width limited by maximum junction temperature.
- \* 2. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

Typical Feature Curve

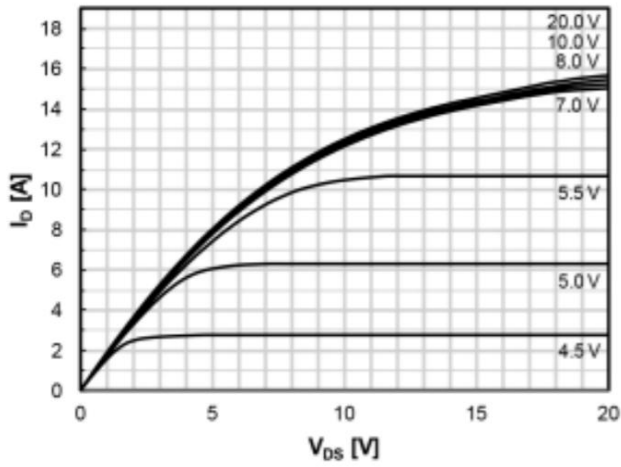


Fig. 1 Output Characteristics

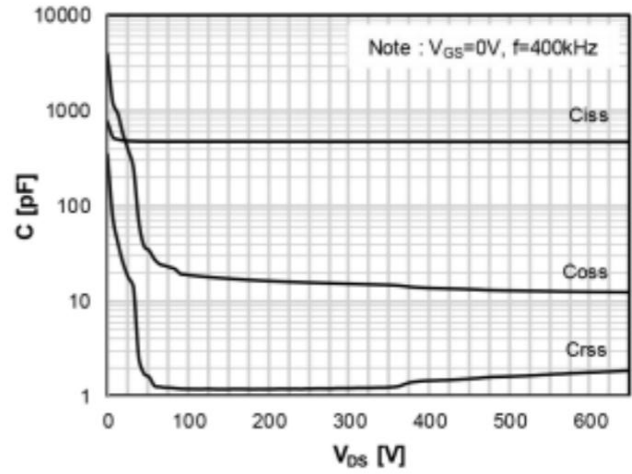


Fig. 2 Capacitances

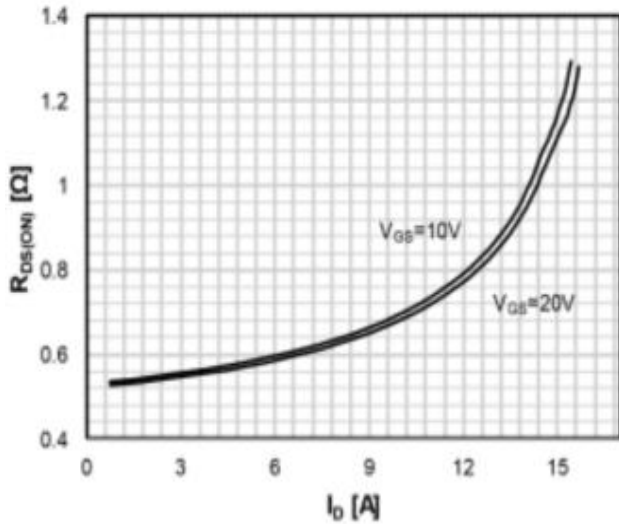


Fig. 3 On-state Resistance

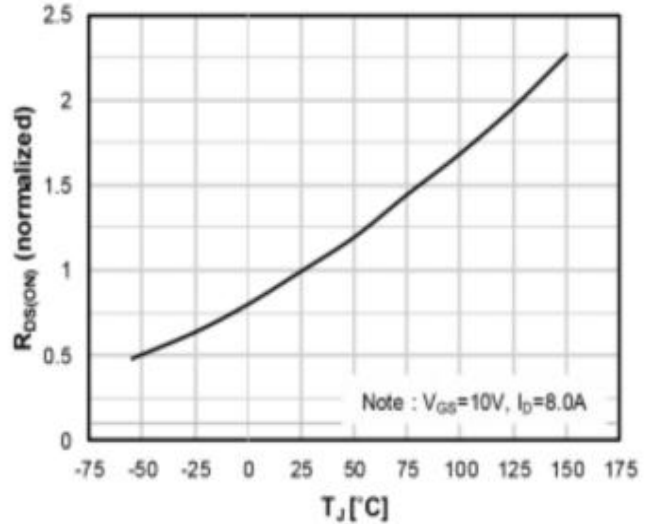


Fig. 4 On-state Resistance with Temperature

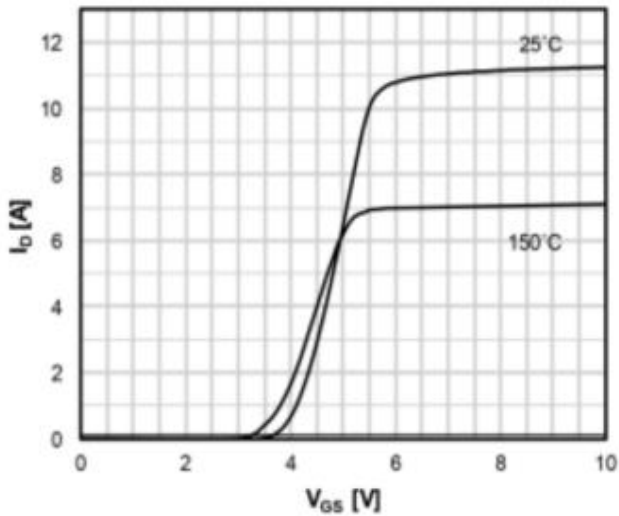


Fig. 5. Transfer Characteristics

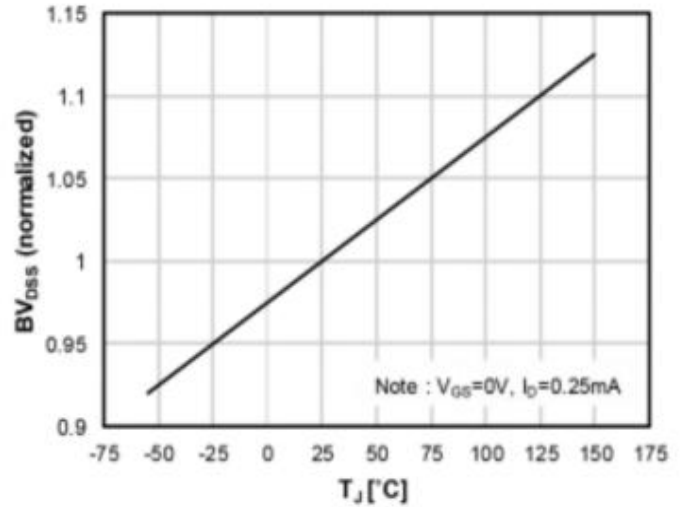
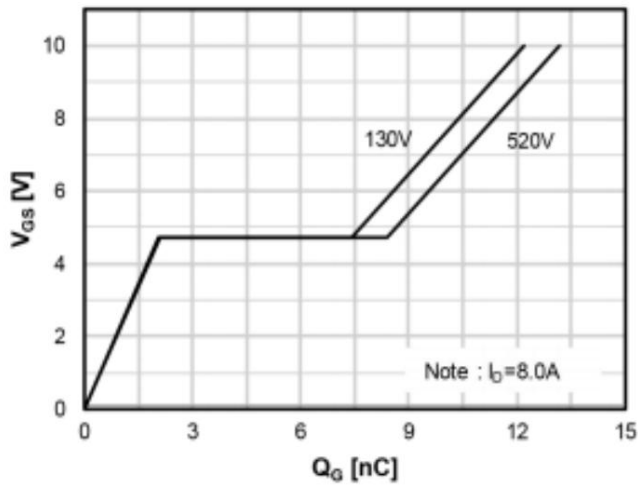
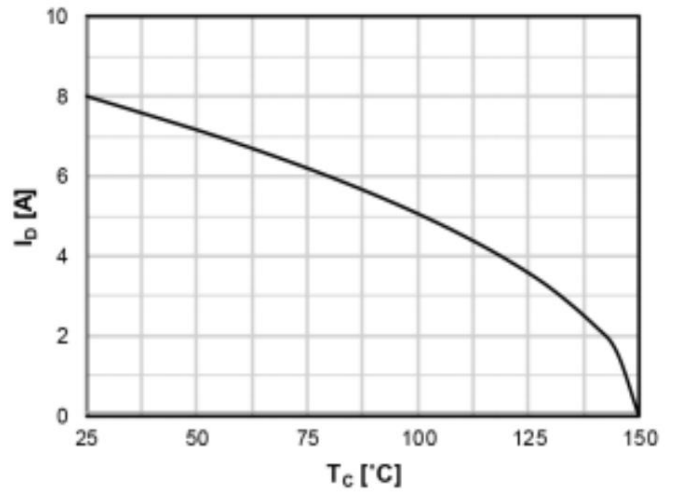


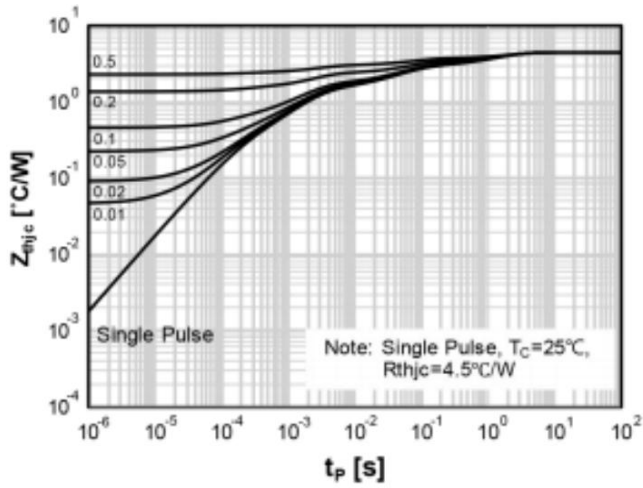
Fig. 6. Breakdown Voltage with Temperature



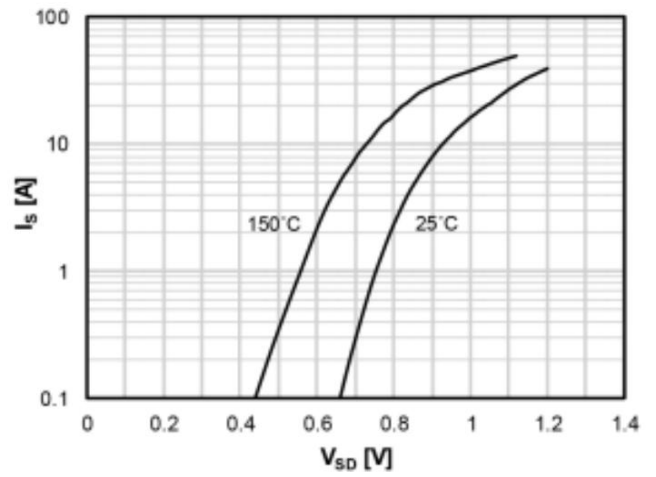
**Fig 7. Gate Charge**



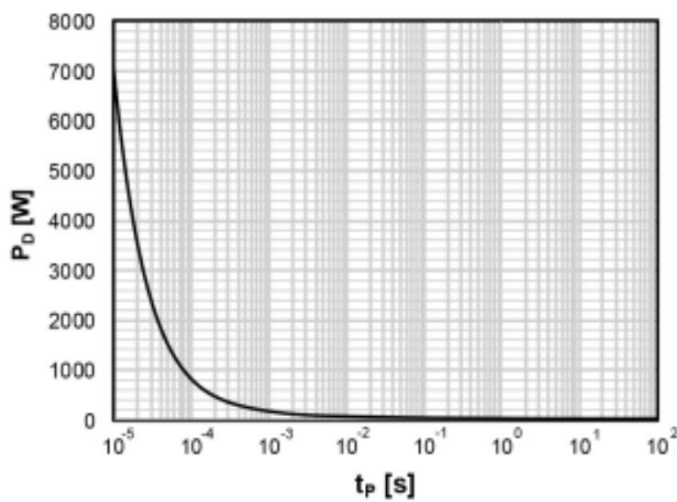
**Fig 8. Maximum Drain Current**



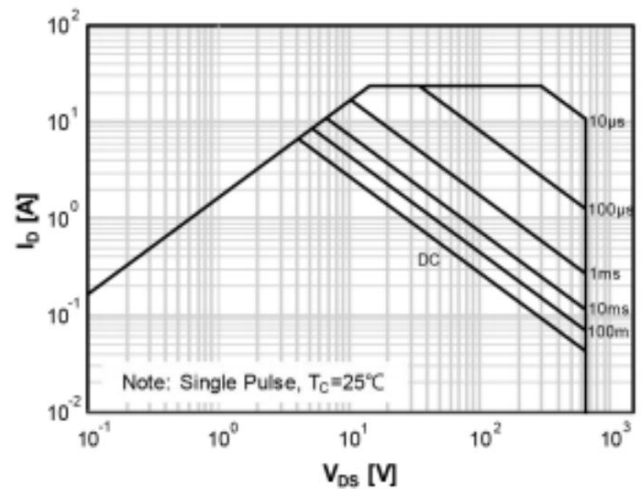
**Fig 9. Maximum Transient Thermal Characteristics**



**Fig 10. Body Diode Characteristics**



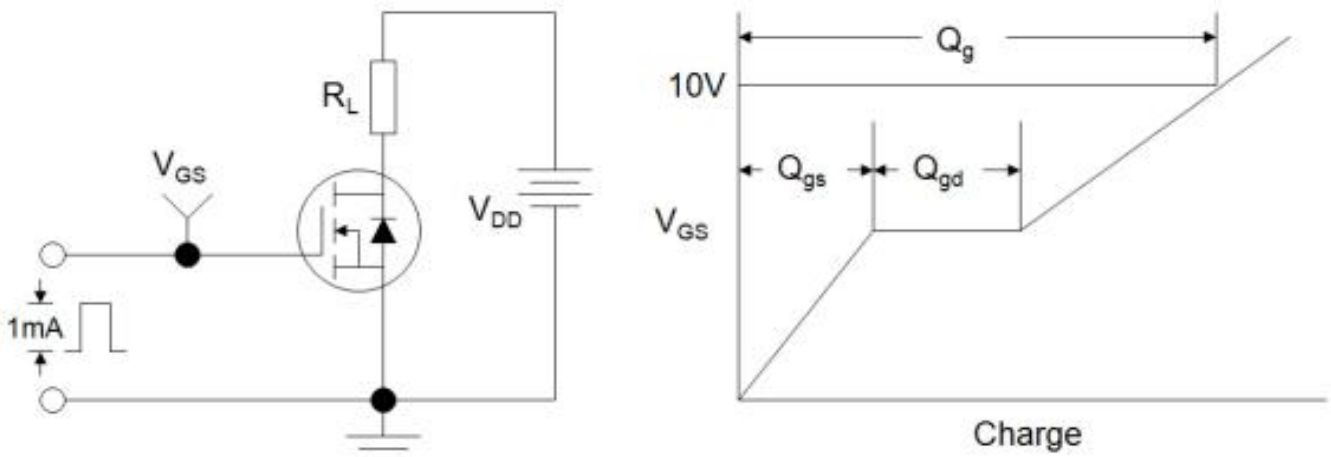
**Fig 11. Power Dissipation**



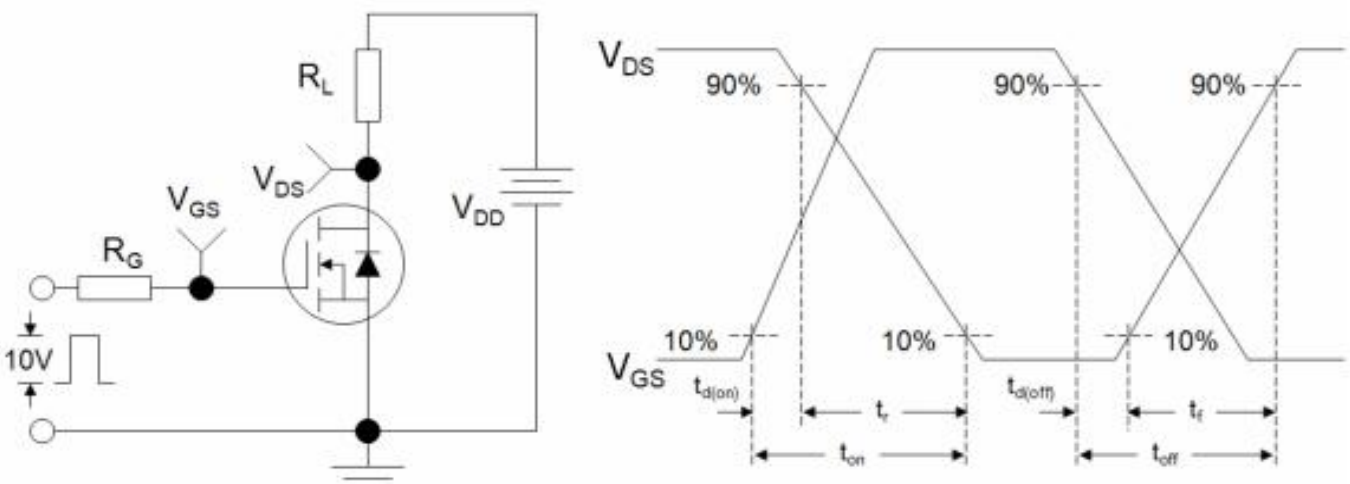
**Fig 12. Safe Operating Area**

## Test Circuits and Waveforms

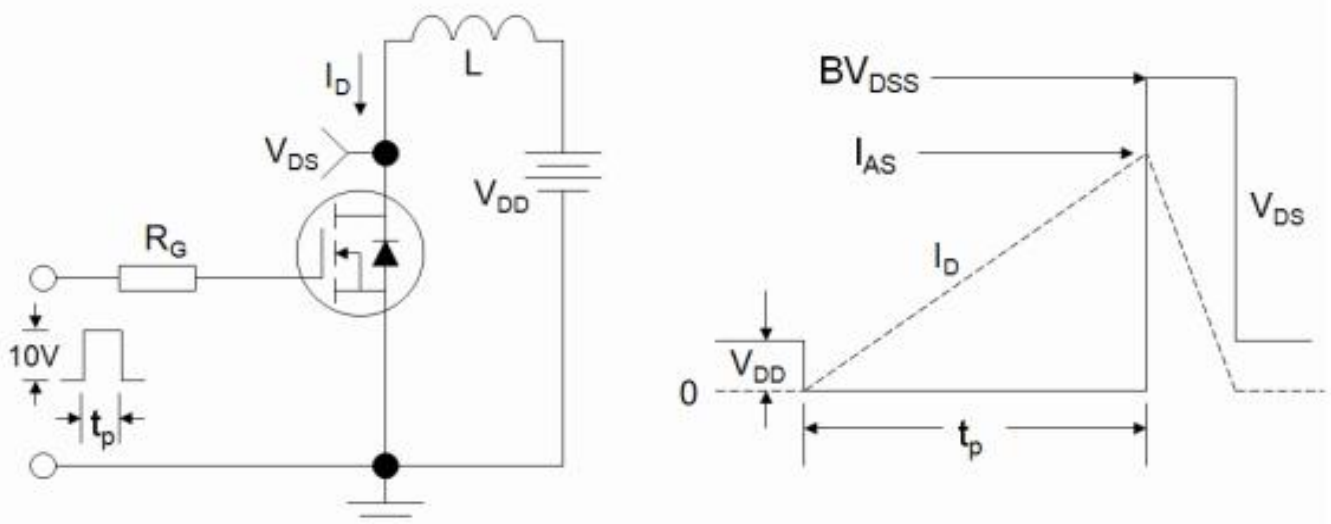
**Figure A: Gate Charge Test Circuit and Waveform**



**Figure B: Resistive Switching Test Circuit and Waveform**

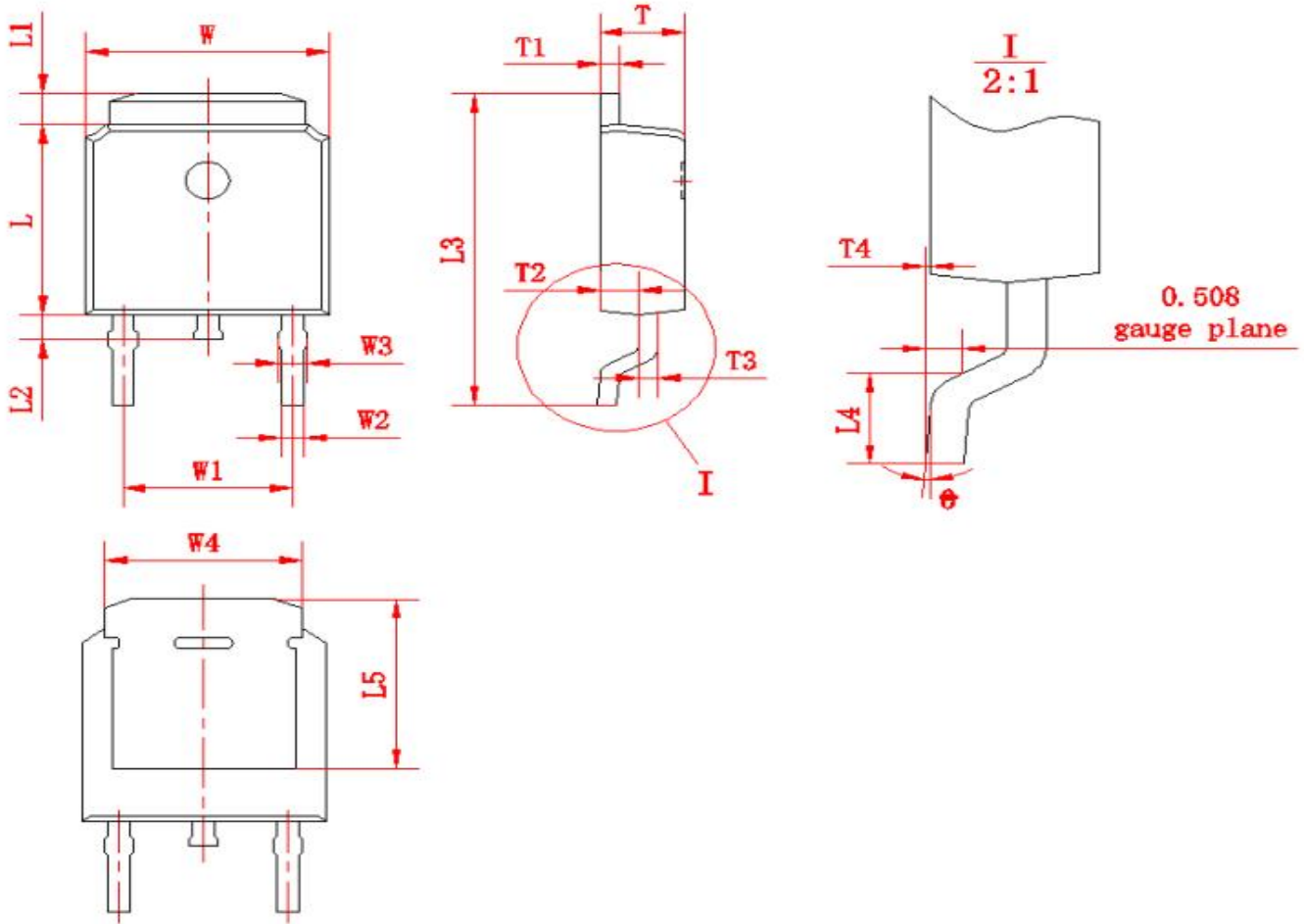


**Figure C: Unclamped Inductive Switching Test Circuit and Waveform**





Package outline drawing(TO-252 Unit: mm)



| 符号 | 尺寸      |      | 符号 | 尺寸     |       | 符号 | 尺寸   |      |
|----|---------|------|----|--------|-------|----|------|------|
|    | Min     | Max  |    | Min    | Max   |    | Min  | Max  |
| W  | 6.50    | 6.70 | L1 | 0.80   | 1.20  | T1 | 0.48 | 0.58 |
| W1 | (4.572) |      | L2 | 0.60   | 1.00  | T2 | 0.95 | 1.15 |
| W2 | 0.6     | 0.8  | L3 | 9.70   | 10.30 | T3 | 0.48 | 0.58 |
| W3 | 0.68    | 0.88 | L4 | 1.30   | 1.70  | T4 | 0.00 | 0.12 |
| W4 | (5.3)   |      | L5 | (5.20) |       | 0  | 0    | 8    |
| L  | 6.00    | 6.20 | T  | 2.20   | 2.40  |    |      |      |

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